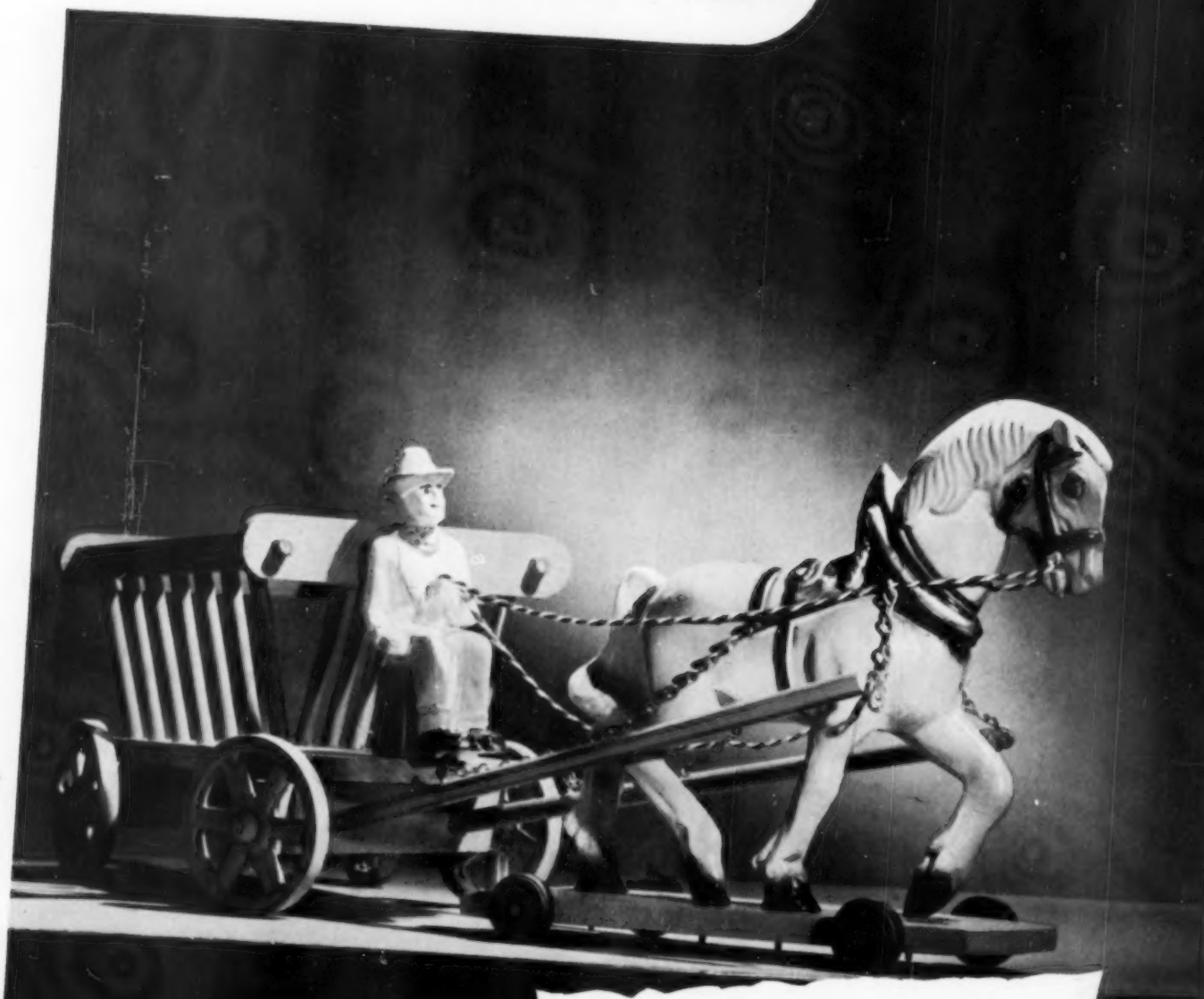
Vol. 4 No. 10

DECEMBER, 1948

SPE NEWS

DURITE



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SPE NEWS

Issued Monthly to all Members of the Society of Plastics Engineers

Volume 4 **Number 10**

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Ohio University
ATHENS, OHIO

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This issue sponsored by

Newark and Quebec Sections

Letters

To the Editor, SPE News
Society of Plastics Engineers,
Athens, Ohio.

Dear Sir:

I believe that other Sections will be interested in some of the problems we have encountered in the Cleveland Section of S.P.E.

We are planning entertainment at every meeting and have allotted the necessary funds for a magician, a strolling singer, a xylophone player, etc., to attend each meeting.

Other suggestions include a telephone campaign to get members out. The Secretary is giving each of the Directors a short list of names and members to call before each meeting. Thus no one man has too much to do. This is in addition to mailed notices.

In addition, my personal suggestion would include cutting down on the number of meetings, and giving more emphasis to fewer gatherings each season.

Our Secretary, Scott Moulton, has also suggested that each meeting be given or assigned to some individual or company to sponsor. Thus responsibility for the meetings can be fixed well in advance and all the

Continued on Page 20

SPE TECHNICAL CONFERENCE
Philadelphia Jan. 19-21

SITUATION WANTED

Have you need for services of a man 30, married, 12 years power plant experience, 6 mo. compression moulding, graduate one year Advanced Plastic Technology at Plastics Industries Technical Institute, Los Angeles, Calif., member of Society of Plastics Engineers?

Willing to undergo training for Sales Representative if above experience cannot be utilized. A. F. Bailey, 725 E. Broadway, Stratford, Conn.

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GUEST NIGHT

NEWARK S.P.E. SECTION

Newark Athletic Club — Feb. 9, 1949

Guests: Members of all Newark Technical Societies

SPEAKERS

Mr. Hiram McCann——Where Do We Go From Here?

Mr. Clinton W. Blount——An Engineering Evaluation of the Plastics.

Hiram McCann

He was born in Carleton Place, Ontario, Canada in 1908. Started as a cub reporter and printer's devil on his hometown paper at 16 years of age. He graduated from McMaster University, in 1929, with a Bachelors degree in Political Economy.

From graduation until the present time he has served in either an editorial or management capacity or both on publications serving 22 different industrial and trade fields embracing such diverse interests as hardware stores, drug stores, millinery shops, garages, food processing, beauty culture, export, and industrial engineering. He was bound to end up in the plastics field and to contribute to it knowledge gained from wide experience in many types of production and marketing—because plastics products and components have many uses and move out into many different markets.

For three years during the war while actively heading up the Industrial Magazines Division of Consolidated Press in Toronto, he was loaned to three different departments of the Canadian Government to do public relations work and trade education on rationing, food conservation and war finance. He was for a time Executive Secretary of the Food Conservation Board of the Government of Canada.

He joined MODERN PLASTICS as Eastern Editor in September, 1945, becoming Associate Publisher in September, 1946, and Editor in September, 1948.

Clinton W. Blount

Clinton W. Blount was born in Temple, Texas, September 24, 1901. He attended the public schools in Fort Worth, graduating from high school there in 1917. He attended Marion Institute in Alabama where he was a part time instructor in mathematics and a tactical officer preparing for the U. S. Naval Academy. He was graduated at Annapolis in 1922. He later took special courses in radio science and public speaking at Columbia University and in business administration at New York University. In 1922 he joined the Radio Corporation of America as a salesman. On March 10, 1924, he joined Bakelite Corporation in the Sales Department. He was elevated to the position of Assistant Sales Manager in 1932.

He was elected on May 22, 1944 as Vice President and General Sales Manager, which position he now holds.

EXHIBIT

Modern Plastics Award Exhibit

Presenting the plastics products and applications that were selected as the outstanding developments during 1948.

Dinner 6:30 PM **Speakers 8:00 PM**

FIFTH SPE CONFERENCE PROGRAM

Advance registration cards, and hotel reservation cards, for the fifth annual meeting of the SPE are now in the mail. The excellent technical program, printed below, was selected after extensive investigation to determine what subjects would be of maximum interest to the plastics industry and the membership.

A special feature of the program will be the presentation of the first three prize winners in the national SPE Prize Paper Contest. As another feature, there will be an exhibit of the award winners of the Seventh Modern Plastics Competition.

There will be a number of small booths to be used as conference rooms, where technical representatives of the suppliers to the plastics industry can confer with engineers. This provides an excellent opportunity for the members to discuss with experts each of the plastics materials or processes in which they are most interested. Displays and exhibits are arranged on the same floor as the auditorium for maximum convenience.

Dr. Russell B. Akin, Speakers Committee Chairman, has completed the speaking schedule, although there may be minor changes in times, or additions of papers of especial interest.

The technical meetings are scheduled between 9:00 a. m. and noon, and between 2:00 and 4:00 p. m. on Wednesday, January 19; between 9:00 a. m. and noon on Thursday, January 20; and between 9:00 a. m. and noon, and 2:00 p. m. and 4:00 p. m. on Friday, January 21.

The annual meeting is scheduled for 1:00 p. m., Tuhrsday, January 20, together with a luncheon meeting, open to all SPE members. The national directors will meet January 19th to discuss policy for the coming year and to hold the election of national officers for 1949.

This is to be the finest program yet presented. Be sure to attend.

Wednesday Morning, Jan. 19

9:00—OPENING REMARKS

9:10

FLAME-RESISTANT CELLULOSE ACETATE MOLDING MATERIALS

Burton E. Cash

Burton E. Cash, Section Head of Plastic Product Development in the Celanese Corporation of America Laboratories at Newark, New Jersey, received his B.S. in Chemical Engineering from Syracuse University.

The extensive development work done in producing a series of **Lumarith XF** formulations to give them low flammability without sacrificing other desirable properties of cellulose acetate molding compounds, will be described in detail. Incorporating certain plasticizers and modifiers, the first formulations yielded injection molded parts having improved gloss, a high order of surface hardness, good dimensional stability and heat resistance as well as low flammability.

They were, however, limited to dark translucent and opaque colors, and in some of these it was difficult to maintain color uniformity. How these disadvantages were overcome by further research, with the use of an improved acetate flake, leading to new formulations which have been used for several commercial products requiring the Underwriters Laboratory approval, will be disclosed in this paper.

9:45

EFFECT OF COMPOSITION AND COMPOUNDING ON PROCESSING AND PHYSICAL PROPERTIES OF RIGID VINYLS

G. E. Field

Mr. Field is a technical Service Engineer with the B. F. Goodrich Chemical Company. His background includes experience as Technical Manager and Coordinator for synthetic rubber plants operated by the Goodrich Company, as plant manager of Goodrich's synthetic rubber plant at Louisville, Ky., and as the Goodrich representative on various Rubber Reserve Committees.

The paper covers the effect of variations in composition on the softening points and plasticities of Geon rigid vinyls. The effect of plasticizers on these properties will also be included. The relationship between plasticity and processing temperatures as well as a rapid method of determining optimum processing temperatures will be discussed.

Slides will be shown illustrating graphically the effects on softening points and viscosities caused by variations in plasticizer content. The composition of the compounds studied has been varied sufficiently to cover quite a range of initial hardness values.

A brief discussion of testing methods used will be included.

10:15

TUFLITE

Harold S. Sell

Harold S. Sell, Manager, Compounding Section, Chemical Products Development, Goodyear Tire and Rubber Company; received his B.S. in Chemical Engineering from Pennsylvania State College, and a Master of Chemical Engineering degree from the University of Louisville in 1941. He has been associated with Goodyear's Development Division since then.

The development of blends of high styrene **Pliolite S6** resin with various rubber-like polymers to produce a family of compounds, known as **Tuflite** compounds, has brought more closely together the fields of rubber and plastics. Blends of the hard rigid styrene resin with the characteristics soft rubber have produced materials with many unique properties, available in wide color range. Among these properties are: (1) excellent impact strength combined with rigidity, (2) the ability to absorb loading and produce stocks in a wide range of specific gravity, (3) ease of molding, (4) machinability on wood or metal working equipment, and (5) post-form ability.

These properties and the possibilities of 'tailor-making" a **Tuflite** compound to meet a desired requirement will be discussed in this paper.

10:45

HIGH POLYMERIC TRIFLUOROCHLOROETHYLENES

Louis C. Rubin

Mr. Rubin is Manager of Chemical Manufacturing for the M. W. Kellogg Company, Jersey City, New Jersey. He received a degree in Petroleum Engineering from Colorado School of Mines in 1927, and the degree of Master of Science in Chemical Engineering from Massachusetts Institute of Technology in 1930. Since 1930, Mr. Rubin has been identified with technical service, engineering design and research in petroleum processing. In 1946 he became Manager of Research of the M. W. Kellogg Company, whose organization he joined in 1930, and has recently been promoted to his present position. He is a member of the American Chemical Society, American Institute of Chemical Engineers and Tau Beta Pi. He received the 1947 W. H. Walker award of the American Institute of Chemical Engineers.

These interesting new materials were developed during the war for the Manhattan District, and are now being produced by the M. W. Kellog Company under the trade names KEL-F and KEL-FLO. Their properties, fabricating techniques and uses will be discussed.

High polymeric trifluorochloroethylene (KEL-F) is a chemically inert thermoplastic which can be molded by conventional methods at from 250° to 300° C. It is insoluble in common organic solvents, is swollen at elevated temperatures by halogenated solvents. It is inert to aqueous acids, bases and oxidizing agents. Its electrical losses are low, and specific resistance is high.

(Please Turn to Page 6)

Season's Greetings

Our sincere wishes for
A Very Merry Christmas
and a Happy and
Prosperous New Year

NIXON NITRATION WORKS • NIXON • NEW JERSEY

Trifluorochloroethylene polymers in the 1000-2000 range of molecular weight (designated KEL-FLO) are oils or waxes. They exhibit the same chemical inertness of KEL-F, and have some lubricating properties. They can be used as plasticizers for KEL-F.

11:45

ALKYD HOT MOLDING COMPOUND

M. H. Bigelow

Dr. Bigelow is Director of Technical Service, Plaskon Division, Libbey-Owens-Ford Glass Company. He received a B.S. in physical chemistry from the University of Pittsburgh in 1933. Dr. Bigelow was a chemist with Lever Brothers Soap Company, was head of the Department of Science, The American College at Salonica, Greece, and was a fellow at Mellon Institute, before joining Plaskon in 1934. The author of three books dealing with physics and plastics, he has a fourth in preparation.

A new thermosetting industry molding compound, based on a polyester type resin, is designated as Plaskon alkyd molding compound, and represents the first use of such a resin in materials for hot molding.

The new alkyd molding compound embodies several features which make it attractive to molders seeking high-speed production procedures. The compound is extremely fast curing and requires relatively low pressures for molding. It permits the use of less massive, less expensive, but fast-closing equipment. The material molds with surprising ease in equipment operated by air pressure, thus eliminating the need for high-pressure hydraulic systems and heavy-duty accumulators.

While in the plastic state during molding, very little pressure is required to flow the material over the mold surfaces. The press must be fast enough to drive the mold parts completely together during the first 2 seconds after the material has reached mold temperature. In most cases 300° to 310° F. is the optimum operating range.

The paper will discuss physical properties, especially dimensional stability, strength, heat resistance, electrical properties, and resistance to chemicals. Molding procedures and mold design will also be described.

PLASTIC INLAYS

CUSTOM MOLDINGS

METAL INLAYS

Any workable metal in any plastic

275 Broad St.
Summit, N. J.

Wednesday Afternoon, Jan 19

2:00

PROTECTIVE FILMS FROM S-POLYMERS

Raymond G. Newberg

Mr. Newberg is a Group Leader in the Chemical Division, Standard Oil Development Co. He was graduated from the South Dakota State School of Mines in 1937 with the degree of B.S. in Chemical Engineering, and received his M.S. in Chemical Engineering from the same school in 1938. He joined the Standard Oil Development Company in 1943, after being associated with Gates Rubber Company and the Chemical Construction Corp. Mr. Newberg's present activities are divided between research on synthetic rubbers and on plastics. He is a member of the American Chemical Society.

S-Polymers, a new series of hydrocarbon thermoplastic copolymers, are produced by low temperature polymerization techniques from styrene and isobutylene. They have good electrical and physical properties, easy processability, and excellent resistance to the penetration of moisture and gases.

Among a variety of applications which have been investigated, the most interesting appear to be in the field of packaging where the resins' resistance to gas and moisture vapor penetration is very advantageous. Results from a series of tests show that thin films of these transparent plastics very effectively prolong the storage life and minimize the shriveling of fresh fruit. Fresh fruits wrapped in films of S-50 Polymers showed very little if any loss in appearance, food value or edibility after twenty-eight weeks, and lost only slightly over ten percent of their original weight. Unprotected fruits were shown by controlled experiments to be relatively inedible in two weeks.

Other applications for S-Polymers include electrical insulation, cast films, modifying agents and processing aids for rubbers and resins, capsules for aqueous and alcoholic solutions, laminates, recording material, and wax modifiers for wax coatings.

2:25

R. M. PAULSEN
U. S. Rubber Co.

SATUSPLY—A new Plastic Resurfacing Material

2:50

PLASTICIZERS

J. Kenneth Craver

Mr. Craver is with the Organic Chemicals Division of Monsanto Chemical Company. He joined the Monsanto research staff in 1938, has specialized in plastics and catalytic hydrogenations, and is coordinator of hydraulic fluids for the Organic Chemicals Division. Mr. Craver received a B.S. degree from Southern Illinois University in 1937, and received an M.S. degree in chemistry from Syracuse University in 1938. He is a member of the American Chemical Society, The American Society for Testing Materials, The Society of Plastic Engineers, Alpha Chi Sigma and Mu Tau Pi.

The importance of plasticizers in the field of plastic moldings, elastomeric extrusions and films and surface coatings has increased phe-

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nomenally with the growth of these industries.

The evaluation of plasticizers has in the past been on a purely empirical basis, but a review of recent work reveals that a point has been approached where some predictions can be made as to the compatibility and efficiency of a plasticizer in a new system.

The importance of plasticizer compatibility, efficiency and permanence will be discussed, together with volatility, food tolerance, flammability, weathering, low temperature flexibility and availability. Some types of plasticizers most useful with various commercial synthetic resins will be outlined and samples of plasticized compositions will be displayed. New types of plasticizers will be described and the steps by which these were developed will be outlined.

3:40

PLASTICS EDUCATION AND RESEARCH AT PRINCETON

Louis F. Rahm

Professor Rahm is Director of the Plastic Laboratory of the School of Engineering, John C. Green Foundation, of Princeton University. He has been on the teaching staff at Princeton since 1926. Following his graduation in 1921 from the University of Michigan he was employed on design and development work at the Viscoloid Company and taught at the University of Illinois. During his career in plastics, Professor Rahm has been a consultant to the industry, has published various articles on plastics, and wrote Plastic Molding, the first technological book on the subject. He was with the High Explosives Section of N.D.R.C. during the war, and returned to Princeton with the proposal that plastic engineering training be established in the curriculum.

The educational objectives of the plastics program at Princeton are instruction and research in the application, processing, fabrication and basic properties of high polymers as engineering materials.

At the undergraduate level, introductory class and laboratory work provides fundamental training. There is a growing demand for the four year engineering Bachelor graduate in the general manufacturing industries. A graduate program of instruction and research is offered to supply the needs of the plastics industry for specialized engineering talent. The curriculum integrates a number of essential graduate courses into a well rounded plan of instruction in plastics leading to a Masters Degree in Engineering.

The research program, sponsored by the Army Signal Corps and various Navy Bureaus, represents unsolved plastics problems accumulated during the war. Some of the studies in progress are: Arc Resistance, Arc Resistant Laminates, High K-Low Loss Materials, Potting Compounds, Rheological Studies, Microwave Measurements and Measurement Methods.

Thursday Morning,, Jan. 20

9:00

W. A. STUBBLEBINE

Office of the Quartermaster General

The Quartermaster Research Program on Plastics Films and Coated Fabrics

9:40

NEW TESTING PROCEDURES BEING DEVELOPED FOR PLASTICS

Albert G. H. Dietz

Dr. Dietz is Associate Professor, Department of Building Engineering and Construction, at Massachusetts Institute of Technology, and is Director of its Plastics Research Laboratory. He is also acting at present as director of the plastics research program sponsored at Massachusetts Institute of Technology by the Plastic Materials Manufacturers Association. Dr. Dietz received the degree of A.B. from Miami University, Ohio, in 1930 and the degree of Sc. D. from Massachusetts Institute of Technology in 1941.

Dr. Dietz's talk will be largely devoted to showing a technicolor sound movie describing the fundamental work in the basic mechanical properties of plastics being carried on under the P.M.M.A. program at the Massachusetts Institute of Technology. The movie was made by the Society of Plastics Industry so that information regarding the work would be more widely available. The

(Please Turn to Page 8)

the time will come

The time will come when you will have to wrestle with some intricate problem in plastic production. It may be some little quirk in formulation, fabrication or finish that jams the works. Testing by a completely equipped organization, staffed with technicians of wide experience, can solve many problems and point the way to new developments in your product and methods.

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In addition we conduct practical usage tests for finished plastic articles. These are subjected to varying conditions of tensile, compression, torsional or impact stresses, temperatures, humidity, pressure or environment to indicate serviceability. Polariscope examination determines uniformity, transparency and imperfections.

The entire laboratory is enclosed in air-conditioned rooms at 77 degrees F and 50% relative humidity.

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program has entailed the development of methods of test and the development of testing equipment to make possible fundamental analyses of the strength properties of plastics. It is directed toward determining the validity of some of the theories respecting the plastic, nonelastic, behavior of materials as they may relate to plastics.

10:10

STYLING MOLDED PLASTICS

Donald W. Biklen

Mr. Biklen is a plastics product engineer with the Shaw Insulator Company. He received the degree of B.S. in Industrial Engineering from Iowa State College. During the war he was an ordnance engineer in the Plastics Research and Development Laboratory, Picatinny Arsenal.

A product is said to be well designed when it has been reduced to its utmost simplification in terms of function and form. A good mold design never comes by chance, nor does a good product design — both are the products of a trained intellect.

Proportion, balance, rhythm, emphasis, harmony, variety, texture and color are the fundamentals of design, with which the plastic engineer should acquaint himself. Good product design should go hand in hand with good mold design. The products of the design-conscious molder get more than their share of the potential market. Many of the most successful plastic products have been produced from molds that were either simple hobbing jobs or practical machining jobs. A well designed product increases sales appeal by creating a pride of ownership which increases the value of the product. It adds length of life to a product because the product remains interesting for a longer period of time.

Of great importance also is the fundamental fact that good design tends toward the utmost simplification of manufacturing processes and hence to economies in production. The material maker, the mold builder, the molder, the product manufacturer and the customer all benefit from sound product styling.

10:45

SILICONES AS MOLD RELEASE AGENTS

W. A. Wiard

W. A. Wiard, Technical Representative of Dow Corning Corporation for the past year and a half, studied at Wayne University, the University of Michigan, Detroit Teachers College and the Institut du Pantheon (Paris). After completing his academic training, he joined the U. S. Rubber Company in Detroit as Development Engineer. In his present post he is concerned primarily with the application and sale of silicone release agents used in the rubber industry and of the new Silastic synthetic rubber.

After a brief discussion of the history, chemistry and basic properties of the various forms of silicones, together with their principal applications, three silicone materials widely used as mold release agents will be described and evaluated. These are a silicone fluid, an emulsion and a grease-like compound. Most mold lubricants either contaminate the product or break down at molding temperatures, leaving a carbonaceous deposit which necessitates frequent and costly cleaning of molds. It will be pointed out that the silicones' high heat stability (which makes them resist oxidation), their relative inertness and incompatibility with organic material, and their lubricity bring them closer to the specifications of an ideal mold lubricant.

11:10

SPE PRIZE PAPER

11:30

SPE PRIZE PAPER

11:45

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Thursday Afternoon, Jan. 20

1:00—LUNCHEON

2:00—BUSINESS MEETING

Friday Morning, Jan. 21

9:00

SURFACE FINISHING OF DIE MOLDS

Roger F. Waindle

Roger F. Waindle, General Manager, Industrial Products Division, Elgin National Watch Company, Aurora, Illinois, received his engineering training at the Illinois Institute of Technology. His major industrial experience has been in the engineering and sale of severe service alloy steels. During the war he was Chief, Tank Automotive Production, of the Chicago Ordnance District for the War Department. With Elgin since 1933, he has worked at the development of industrial products, including sapphire tools and wear-resistant devices, diamond abrasives, tools and products peculiar to the manufacture of watches.

This paper, profusely illustrated with specially prepared slides, will describe the various methods developed by the watch industry for economically obtaining better surface finishes. Particular emphasis will be laid on machine parts, tools, dies and molds. An analysis of these finishes and their measurement, and the advantages of higher finishes, will be fully discussed. Divided into three parts, the paper will first explain the "what" of finishes—their language and measurement methods; then the "why"—the increased wear resistance, lower friction and superiority of parts produced from higher finished machine components and molds; and finally the "how" of finishes, which will include a discussion of their economics, machining methods and a complete demonstration of the new diamond abrasives used for producing higher finishes more economically.

9:50

STEELS FOR MOLDS AND HOBS FOR THE PLASTICS INDUSTRY

Peter Payson

Peter Payson, Assistant Director of Research, Crucible Steel Company of America, has been employed by that company since 1923, first the Metallurgical Laboratory of the Halcomb Division at Syracuse, New York, and since 1929 in charge of the Research Laboratory at Harrison, New Jersey. For the past seven years he has also lectured on Metallurgy at the Graduate School of the Stevens Institute of Technology, Hoboken, New Jersey. Mr. Payson holds a B.A. from Columbia College ('20) and a Met. E. from the Columbia Engineering School ('22). He is the author of several papers on alloy steels and has been granted a number of patents.

Steels are far from simple either in composition or in their response to heat treatment. Because of this, some steels are soft and plastic enough to be shaped into molds readily at room temperature in conventional presses, whereas other steels are hard and tough enough to serve as the hobs which form the impression in the steels that are used for molds. This paper is a concise presentation of the kinds of steel in use to-day; the reasons for the wide variety that exists; the basic principles that govern the heat treatment of steel; specific description of the steels used for molds and hobs in the plastic industry; and the heat treatments of these steels.

10:20

PLASTICS MOLDING

Adolphe J. DeMatteo

Mr. DeMatteo is Asst. Chief Engineer of the Watson-Stillman Company. He is a graduate of the College of Engineering, New York University, and did post-graduate work at Stevens Institute and the Newark College of Engineering. His experience with problems arising from the application of tydraulics to plastics molding is extensive, and is based on intimate association with the field of applied hydraulics, particularly as it related to the design of plastics molding machinery.

Despite the antiquity of the hydraulic press, tremendous improvements have been made to give the machine its many modern refinements and its present day flexibility. Many of these improvements have come about under the impetus of demand for better machinery in metal forming and plastics molding. In plastics molding the most important factors in the use of the modern hydraulic press are its design, selection and maintenance. An understanding of some of the principles of design is important to both the selection and maintenance of machinery.

Commencing with definitions of the principal technical terms, the paper demonstrates the basic law of the hydraulic press and its extension to modern machinery used in plastics production. The application of these principles to the selection of machinery for specific production jobs is discussed, together with some important points in the care and maintenance of hydrauiic machinery.

11:10

THE TROUBLE SHOOTING OF MOLDING PROBLEMS

Frank J. Donohue

Frank J. Donohue, Manager of Technical Service, Thermosetting Molding Materials, Monsanto Chemical Co., Plastics Div., majored in Chemical Engineering at the College of the City of New York, from which he received two degrees: B.S. ('27) and Ch. E. ('30). He was with Resinox Corporation and then the Plastics Division, Monsanto Chemical Co., since 1934, in Technical

(Please Turn to Page 20)

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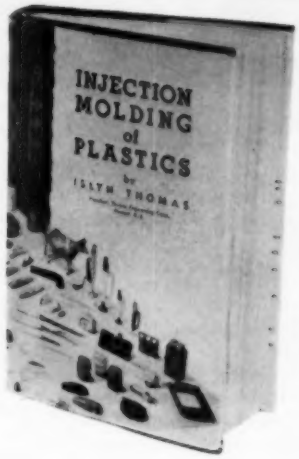
INJECTION MOLDING of PLASTICS



This book will make a worthwhile XMAS Gift

By ISLYN THOMAS

President, Thomas Manufacturing Corp., Newark, N. J.

FOR the plant engineer, the product and mold designer, the shop foreman, the plastics technologist — a detailed, specific and thoroughly practical coverage of the history, development and mechanical problems involved in injection molding. This is a unique volume indeed, written by an engineer of great competence and broad experience. An idea of its scope may be gained from the fact that it contains 450 illustrations (including five color plates), most of which deal with the mechanical details of presses, mold design and operating techniques. Everything of any importance regarding injection molding is recorded, and up-to-date methods of designing, machining and utilizing molds with all types of plastics are fully and painstakingly described. This book will be invaluable to everyone engaged in molding plastics by the injection method.

WHAT REVIEWERS SAY ABOUT THIS BOOK:

Dealing solely with injection molding and the surrounding problems this is the first volume to be written exclusively for this branch of the plastics industry. The author himself has a background of technical "know how" in modern injection methods which is definitely reflected in the concise presentation and solution of the manifold problems of this industry.

Not to be confused with strictly scientific work on injection molding, the author does expound the scientific and theoretical end of both machine and material employed. Frankly, Injection Molding Plastics, is the only book for the person who is looking for reliable data on injection molding problems. Ideally written for the executive or man in the plant, technicians will value this book for ready reference information which so clearly means better moldings through injection.

Canadian Plastics, May 1947.

Mr. Thomas, who is president of the Thomas Engineering Corporation, Newark, N. J., is most eminently fitted for the production of this book in view of his extremely wide experience in this specialized field. He has, in fact, produced a monumental work, unique in design, completely balanced and eminently satisfactory from an engineering point of view.

Both author and publishers are to be congratulated on this production, which places on record a clear and factual record of this branch of engineering science. *Plastics.*

Proprietors—Temple Press Limited
Managing Dir.—Roland E. Dangerfield
Editor—M. D. Curwen, B.Sc., A.R.I.C.
Offices—Bowling Green Lane, London, E.C.I.

For those who want to be up-to-date on injection molding of plastics and the plastics industry a comprehensive book on injection molding is long overdue. In this field Mr. Thomas' book is the first of its kind. He has selected his material thoughtfully, and has brought to its presentation the care and precision gained in over sixteen years of practical experience in the plastics industry. The book is at once a text in its factual sequence, a handbook in its wealth of technical data, and a complete survey of plastics and injection molding that is simple enough for the laymen to follow. No effort has been spared in assembling data covering every branch of the industry, and these have been made graphic by hundreds of instructive illustrations. Industrial schools, engineering colleges, designers and molders should find this book indispensable.

It cannot be too highly recommended to all those who are interested in plastics or who plan to share in the industry's bright future.

CHARLES A. BRESKIN,
Editor and Publisher
Modern Plastics.

By his many years of practical experience and his competent presentation of the subject, Mr. Islyn Thomas has produced a book which should be a valuable source of information to all who are interested in this important section of the industry. Dealing with all aspects of injection moulding, from its early history to the finer points of moulding technique, it is written in a clear and practical manner, equally suitable for students, technicians and newcomers to the industry.

It is to be hoped that this is one of the first of many similar publications—in which a specific section of the industry is competently presented by an expert in that particular sphere.

British Plastics, July, 1947.

An exceptionally complete treatment on the subject, this volume gives a background history of the industry, a full discussion of both the materials and production techniques, discussion of product design for molded parts, the design and construction of molds and of estimating and costs. Appendices give definitions and data of physical properties.

The book is at once a text in its factual sequence, a handbook in its volume of data and a survey of plastics and injection molding that is simple enough for the layman to follow.

—*Product Design and Development News June, 1947.*

A great deal more is covered than is given in this short review and the book seems to have covered the field extremely well. It appears to this reviewer that this book could well be used as a text in a course on injection moulding. Supplemented by actual problems under the guidance of competent instructor such a course would enable the student engineer, manufacturer or injection shop foreman to cope with practically any problem which might come up in the course of his work.

—R. P. PIPEROUX,
Celanese Corporation of America
Chemical Industries, Sept., 1947.

Mr. Thomas' book, *Injection Molding of Plastics*, is the first to the reviewer's knowledge to cover adequately this specialized form of molding. The book, which can be used as a textbook as well as a handbook, is written in laymen's language, and contains many excellent photographs and diagrams with each chapter.

Because of its up-to-date and comprehensive treatment of injection molding, the reviewer recommends this book very highly to anyone —technician or layman—interested in plastics.

W. B. PETZOLD,
—General Electric Review, Oct., 1947.

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INJECTION MOLDING of NYLON

By LOUIS PAGGI
Engineer, Technical Service Laboratory
E. J. DuPont de Nemours & Co., Inc.

The equipment and procedure for injection molding of conventional thermoplastics are based upon the fact that these become softened by heat, gradually, over a considerable range of temperature. FM-10001 nylon, however, has a relatively sharp melting point and becomes truly liquid. For these reasons, the injection molding of this nylon requires modifications of equipment and procedure, but these present no difficulty if their functions are clearly understood.

Plastics molded in conventional injection-molding machines are plastified in the heater assembly by heat transmitted through the walls of the machine. There is no provision for agitation, and the flow through the machine is linear rather than turbulent. As a result of this design, and of the poor thermal conductivity of the plastics, the plastification will be non-uniform unless the material progresses rather slowly through the machine.

This is not a serious difficulty in the molding of conventional thermoplastics which have a wide molding range, i. e., a considerable spread between the lowest temperature at which they can be extruded and the highest temperature which they will tolerate without decomposition. But the range of temperature for the molding of nylon is relatively narrow. Instead of softening gradually with increase of temperature, it softens practically not at all before melting rather abruptly to a liquid which flows as freely as lubricating oil. Thus the minimum effective temperature is that of the melting point. On the other hand, the material is subject to damage if heated more than about fifty degrees Fahrenheit above the melting point. Accordingly, it is not practicable to avoid non-uniformity of plastification by driving an excess of heat into the material before it reaches the nozzle, and thus, because of the poor thermal conductivity of the nylon, there is always the risk that granules will arrive at the nozzle in an unmelted condition.

It is essential that this be prevented, because of the several bad effects of allowing unfused particles to enter the mold:

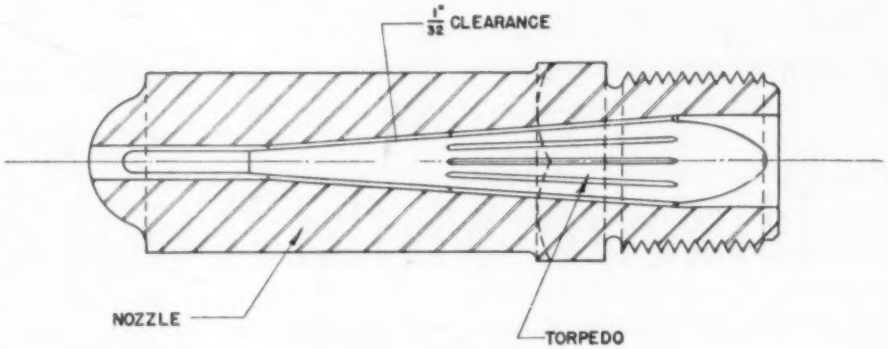
(1) The molded articles will be weak because the unfused particles do not bond well with the fused material as it is chilled.

(2) Shrinkage will be non-uniform, because the density of the unfused particles, which have solidified at atmospheric pressure during the preparation of the molding compound, is less than that of the bulk of the article, which is solidified under the heavy pressure of the molding machine.

(3) The accuracy of dimensions will be unpredictably impaired by the random distribution of unfused particles in the article.

(4) The non-homogeneity of structure and the non-uniformity of shrinkage will cause internal strains and warpage.

(5) The appearance of the article will be poor because the non-uniformity of density produces a rippled effect on the surface.



NOZZLE FOR NYLON

The obvious way of avoiding this difficulty is to provide a means of filtering unfused material out of the stream of liquid approaching the nozzle.

The first device used commercially for this purpose was simply a series of wire screens, known as a screen-pack (1). This was completely effective in holding back unfused particles, but was unsatisfactory in some other respects. At best, it offered considerable resistance to the passage of the molten nylon, and this resistance might become objectionably increased by accidental shifting of the screen in operation, which would reduce the effective channel, or by piling up of unfused particles to block off the center of the circular screen. The screen itself had little effect of conducting heat from the hot wall of the nozzle to melt unfused particles in the center of the stream.

Subsequently other devices have been developed which are free from these faults. It was established that unfused particles could be effectively restrained from reaching the mold if the molten nylon were passed through orifices of diameter not greater than about 0.040 inch.

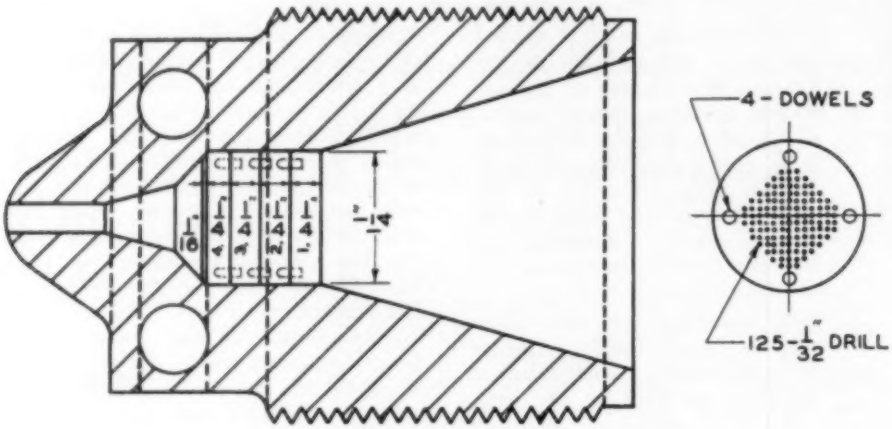
The first of two devices based upon this fact was a nozzle equipped with a torpedo having at all points a diameter 1/32 inch smaller than the inside diameter of the nozzle (Figure 1). Since the cross-sectional area of this annulus, with its thickness 1/32 inch, must be equal to or somewhat greater than the cross-sectional area of the nozzle bore, this type of filter is especially adapted to use in nozzles of large diameter. And, since a certain minimum of linear travel is required to effect the melting of unfused particles which are small enough to enter the annulus, this device is best adapted to nozzles which are not extremely short. This device was first recommended for use on a 2-ounce Lester machine in February 1947.

The filter device which is now

(Next Page Please)

(1) Akin, R. B., and Teagarden, J. E., "Modern Plastics" 21 Nov. 1943, p. 115.

most generally used consists of perforated blocks of metal fitted closely within the nozzle (Figure 2). The holes are 1/32 inch in diameter, and must be sufficiently numerous to give a total cross-section not less



FILTER & NOZZLE FOR NYLON
FOR 8OZ. INJECTION MACHINE

than that of the nozzle bore. The length of the holes must be not less than ½ inch, and sometimes 1 inch is preferred. Because of the difficulty of drilling these tiny holes deeper than about ¼ inch, the filter block is actually an assembly of two or more plates ¼ inch thick. In preparing them, in order to ensure alignment of the holes, the plates are dowelled and numbered in the order in which they are drilled. This device has the advantage over the screen-pack that it effectively conducts heat from the heated walls to the center of the stream.

Because molten nylon is a fairly mobile liquid, steps must be taken to prevent it from running out of the nozzle ("drooling") when the sprue bushing is withdrawn between shots. The filtering devices mentioned above have a tendency to reduce the drooling somewhat, but a filtering device which would effectively prevent drooling would offer so much resistance to the flow of the molten nylon under pressure that it would prevent the adequately rapid filling of the mold and cause splay marks on the surface of the molded article.

Drooling can be prevented by positive mechanical shutoff. But, without the use of a mechanical shutoff, drooling can be prevented by proper control of the temperature of the nozzle, and this is entirely feasible by the use of automatic controls. If the temperature of the nozzle is held just about at the melting point of the nylon, the stream which would otherwise drool will freeze in the tip of the nozzle. The tiny solid mass thus formed does no harm, because it will be caught in the cold-slug well.

ROCHESTER

45 members of the Rochester Section of the Society of Plastics Engineers met on Tuesday evening, November 16, 1948, at Lorenzo's Restaurant for a dinner meeting.

Dr. R. B. Akin of E. I. Du Pont De Nemour & Company, Arlington, New Jersey, spoke on "Injection Molding of Nylon and Polythene". Dr. Akin is a well known speaker; nylon and polythene being among the newer molding compounds.

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PROS AND CONS OF MOLD DESIGN RESPONSIBILITY DEBATED AT NEWARK

By HAROLD SCHOR

Who is respnsible for the design of molds—the designer or the user? This controversial topic was the subject of the evening at the November meeting of the Newark Section.

Upholding the users' viewpoint was Clarence M. Coe, of the Shaw Insulator Company. Mr. Coe maintained that in designing plastics products there must be close cooperation between the stylist, customer, and molder. The customer must indicate all technical details and various mechanical and functional factors that must be considered. The stylist lends his talents to creating a design and style which will be pleasing from the customer's point of view and will employ color in keeping with the trend of the times. The molder can select the plastic which will be most satisfactory and may suggest changes which will improve the part or make it more economical to produce.

After final drawings have been approved by the customer, the molder is ready to start designing the mold. After the mold is designed, it is the mold maker's responsibility to use the correct steel and follow the drawings accurately. The mold maker should know the various tool steels used in manufacturing molds, methods of working this steel and, what is very important, make sure that the steel is hardened in accordance with the molder's specifications so that it will stand up in constant use. The mold maker is not and cannot be held responsible for the design of the mold.

According to Mr. Coe, these are the responsibilities that the customer must assume:

1. He must make sure his product drawing is right.
2. He must give correctly all supplementary information needed by the molder.
3. He must determine by test whether or not the samples submitted are suitable for the application before production starts.

However, the customer should not assume responsibility for design and procurement of the mold, because:

1. The customer does not know what equipment may be available in the molder's press room.
2. The customer cannot know the methods and labor practices found effective in the molder's shop.
3. The customer cannot be up-to-date on mold design practice.
4. The customer cannot hold the molder responsible for quality control of his parts—unless the molder has designed and procured the mold.
5. Preforming and preheating practices vary throughout the country.
6. The customer is naturally tempted to design and build a cheap mold. Chaep molds produce cheap parts. The customer should be interested in low cost rather than cheap parts.
7. The customer in designing or furnishing the mold assumes responsibility for its care and maintenance. He has no means to recover for careless use of his tool.

Mr. Coe went on to assert that the tool room or mold maker should not assume responsibility for the design of the mold, because:

1. The mold maker does not know what equipment may be available in the molder's press room.
2. The mold maker cannot know the methods and labor practices found effective in the molder's shop.
3. The mold maker cannot be up-to-date on mold design practice.
4. Preforming and preheating practices vary throughout the country, and this affects design of tools.
5. The mold maker also might design a mold which he

When WE get a blueprint from one of you lovely customers . . . we STUDY it! (The above scene is *not* in our shop . . . *we* allow no gambling whatsoever.)

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However . . . instead, we pore over these blueprints-by-Rube Goldberg until we *make* 'em come out right! We admit our Engineers are regular Tau Beta Pi's when it comes to modifying designs of pieces our Summa-Cum-Louder Production Department is to produce for you ("X" pieces a day for the more days the merrier).

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MOLDERS OF MOST PLASTICS BY MOST METHODS

could build cheaply and sell at a high price—and cheap molds produce cheap parts—not necessarily good or low cost parts.

Having eliminated the customer and the mold maker, stated Mr. Coe, there is no one left but the molder to assume the responsibility for the mold design and performance.

Eric Gronemeyer, Sameric Engineering Company, supported the designer's viewpoint. Mr. Gronemeyer started by first clarifying the term "designer". The production designer, tool designer and engineer are all employed by or working for the plastic industry. It is the designer who must explain to the inventor and artist why collapsible molds are not desirable and why one doesn't cement styrene to polyethylene. Many inventions and modern illustrations undergo drastic changes by the time the designer has reshaped the production into a sensible and practical molding job. The designer must be well acquainted with most of the plastic materials which are commonly used.

In designing an article, stated Mr. Gronemeyer, the designer must clearly visualize the mold in every detail. He must know whether it can be machined, hobbed or cast. He must be sure that it can be mitered and fitted to line up properly. He must be aware of thin wall sections that are likely to crack in hardening or during the first few hours of production, whether to strip the article from the mold or to use ejector pins, where to gate and to vent the mold. All this and much more will influence the production design.

SPE CONSTITUTION CHANGES SLATED FOR JANUARY ACTION

Changes to be voted on by the Members on Constitutional Changes.

1. **Article II, Membership**
   Section 1 C-5

The change suggested is to add a new classification to the Membership, this section when amended will read as follows; "The Membership of the Society shall consist of Members, Associates, Juniors, Honorary Members, Life Members and Professional Plastic Engineers.

2. **Section 2 C-6**

A new paragraph No. 3 to be added to include the qualifications of the Professional Plastic Engineer to read as follows;

3. A Professional Plastic Engineer to be a person having either ten years acredited experience qualification within the Plastic Industry in either tools, materials or processes,
   Or an aggregate of ten years including the follow-

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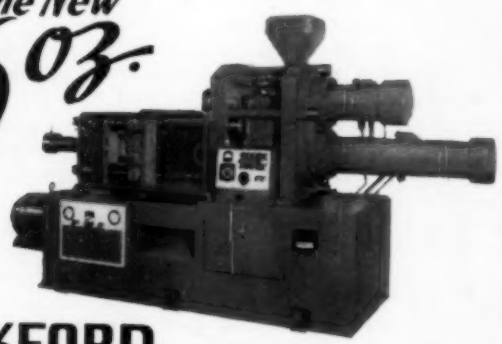

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ing educational credits in lieu of experience: PhD —7 years credit, M.S.—5 years credit, B.S.—4 years credit. A Bachelors Degree in any non-technical school shall receive a 2 year experience credit.

3. **Section 7, C-11, C-12 and C-12B.**
This is the proposed Constitutional Amendment submitted by the Northwestern Pennsylvania Section.

Section 7, C-11. Members, Honorary Members, Life members, Associate Members and Junior Members shall have the right to vote and to participate in all affairs of the Society.

C-12. Members and Life Members shall have the right to hold elective office.

C-12B. Associate, Junior, and Honorary Members shall have all of the other rights and Privileges of Members except the right to hold elective office.

Changes Suggested by Directors

3A. **Section 7, C11.**
Professional Plastic Engineer, Member and Life Members shall have the right to vote and hold elective office and participate in all of the affairs of the Society.

Section 7 C-12.

Associate and Junior Members shall have all the rights and privileges of regular membership with the exception of holding a NATIONAL OFFICE.

Section 7 C-12 A.

Honorary Members shall have all privileges except the right to vote and hold elective office.

4. **Article III Admission to Membership**
Section 1 C-18. Delete words "or of the Advisory Board" to read as follows.
Any member of the Council may nominate any Mem-

(Next Page Please)

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ber in good standing who possesses the qualifications provided in C-10 hereof for election as a Life Member. Such nomination shall be presented in writing and must include the reasons for the nomination. The election of a Life Member shall be by letter-ballot of the Council, and two dissenting votes shall defeat election.

5. **Article VI Management of the Society.**
   Section 2 C-27. Change to read as follows.

The Council shall consist of Directors who are elected by the Members of each geographic Section, and a Director at Large who shall be the retiring National President, such Directors shall be Members in good standing. The Directors shall be elected as provided in the By-Laws.

6. **Article V Meetings of the Society.**
   Section 2 C-24. Add words "or shall be published in the previous months issue of the Official Publication" to read as follows:

Written notice of all business meetings of Members, stating the time and place, shall be sent to each Member by first class mail at least twenty days prior to the date of such meeting or shall be published in the previous months issue of the Official Publication.

7. **Article IX The Advisory Board.**
   Section 1 C-40 and 41.

Since we have a Director from each Section on the Council the Advisory Board is non-operative so it should be DELETED from the Constitution.

Henry Williams, treasurer of the American Insulator Corporation, New Freedom, Pa., died very suddenly on November 19, just four days after his 51st birthday. Mr. Williams started with the company as a bookkeeper in 1925, and became Assistant Treasurer and Assistant Secretary in 1931. The following year he was elected Secretary. He had been Treasurer since 1937.

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By WALTER KOZY

As of November 1, 1948, STUART P. MILLER has been made Product Manager for Lucite acrylic resins operating out of Wilmington, Delaware. JACK ULLMAN has been made technical representative to the automotive industry and FRED BERDAN is now the Detroit Sales Representative for the entire line of DuPont Plastics.

CHARLES L. KELLER, former production manager of the Plastics and Automotive Divisions at Fabricon Products, Inc., at River Rogue, Michigan, has joined Walter Noble at the Morart Gravure Corp., of Holyoke, Mass. Best of luck to you, Chuck!

MR. J. R. FINN, Sales Manager of the Plastics Division, Standard Products Company, St. Clair, Michigan, announces that MR. CHRISTIAN B. HAAS has been made Production Manager, replacing C. M. Greene, who recently resigned. Mr. Haas was formerly process and methods engineer with the Ternstedt Division of General Motors in New Jersey and Detroit.

Our thumbnail sketch of the month:

This month's personality hails from the Quaker State, where he was born on August 10, 1911, in Avalon, a suburb of Pittsburgh. He attended both the University of Notre Dame and the University of Pittsburgh, from which he graduated in 1934. After short stints with Remington-Rand and the Brockway Motor Company, in the Sales Department, he went to work for a large materials manufacturer as a sales neophyte. In 1937, he was transferred to Detroit, where in 1942, he became district sales manager. One of the charter members of the SPE, he has been a Director and Vice-President of the National Organization. At present he is a Director and Secretary of the Detroit Section. Who is he? (See page 19.)

PENN ACTIVITIES

By PAUL ROCHE

Mr. Stanley Berg has accepted the appointment to be "Meeting Sponsor" for the December, 1948 meeting of the Northwestern Pennsylvania Section, so the success of this meeting is assured. Mr. Berg's agency is located in the Frick Building at Pittsburgh and he represents the Watson-Stillman Company for this area. His interest and participation in affairs of the section have been very keen, as evidenced by the distance he travels to attend.

The Erie Resistor Corporation, Erie, Pennslyvania, has just added a 28 ounce Watson-Stillman injection molding machine to its battery of presses. This pioneer injection molder specializes in custom molding work, serving predomanantily the radio, automotive, and electrical industries and has built up quite a reputation on decorative work. Active members from the plastics division of Erie Resistor Corporation are G. Richard Fryling (president), Robert Kling (Chief Mechanical Engineer), William Conroy (Sales Manager), Ralph Dudley (Process Engneer), John Specht (Specifications Engineer), and Charles Williams (Tool Supervisor).

Superlon Products of the Superior Plastics Company of Chicago announces a polystyrene decorative and useful salt and pepper set as a practical and attractive gift item. The material is destaticized to reduce attraction on the surface. Red and white, the set is proving to be extremely popular.

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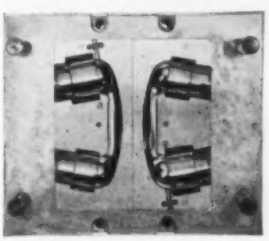
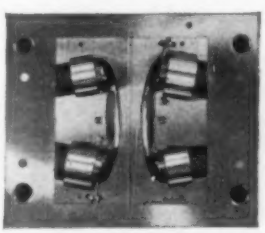
Specifications for this job were received in metric system—and were then translated into linear for the sake of precision. Once accomplished, skilled craftsmen at The Newark Die Company proceeded to produce a set of molds exemplary of our high-quality workmanship.



TOP HALF OF MOLD



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ST. LOUIS NOTES

By C. TODD CLARK

Our November meeting was a success and well attended by members and guests.

Since it is our St. Louis Section policy to have guest speakers who are plastic fabricators for their own use, as often as we can; we were pleased to hear a talk by Mr. Walter Kuenzlie, Chief Cabinet Engineer, Servel Corp., Evansville, Indiana. Mr. Kuenzlie's subject was: "Application of Plastics in Household Refrigerators." In his discussion he gave a detailed history of the advantageous use of plastics, based on their values as a basic material and not as a substitute for other materials. Disadvantages were also brought out in developing the parts and materials.

Mr. Kuenzlie's excellent talk was very well received and enjoyed.

Our Christmas party, annual election of officers and their installation will make a full program for our Dec. meeting. A grab bag of plastic presents affords every member at least a start on Cchirtsmas.

We wish all S.P.E. section a Merry Christmas and a Very Prosperous Plastics New Year.

Commenting on the fine first-prize winning article on Coumarone-Indene Resins, by Carl E. Snyder, published this spring in the SPE News, the Barrett Division of the Allied Chemical and Dye Corp., wishes to call to the attention of readers that certain uses of these resins as described in the prize paper are covered by patents. Readers who are interested in uses of coumarone-indene resins should first investigate the ground covered by these patents by consulting the patent office, or inquiring of the Barrett Co. Patents in particular, cover the use of these resins dispersed in, or used for the vulcanization of, butadiene-styrene copolymers.

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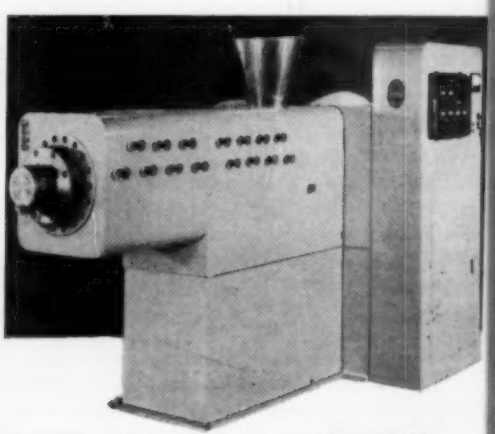

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KEMPER SPEAKS AT QUEBEC

By W. LYNCH

Mr. W. H. Kemper of the metallurgical staff of the Carpenter Steel Company addressed the Quebec Section on Oct. 18, on Mold and Hob Steels and their Heat Treatment. There were over thirty in attendance and an interesting discussion followed the talk. Members were particularly pleased at the fund of practical knowledge displayed by Mr. Kemper.

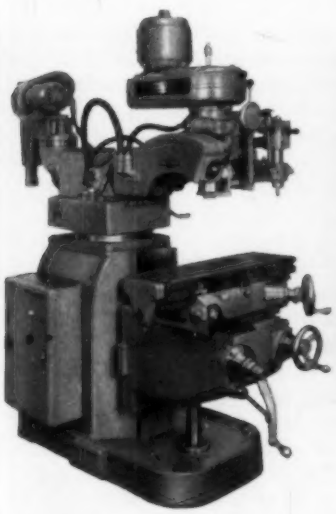
On Nov. 24, Mr. Duncan Douglas, General Sales Manager of B. F. Goodrich Chemical Company, Kitchener, Ontario, presented a talk on the Vinyl Paste Forming Resins. This was the first thermoplastics topic discussed at a Quebec Section meeting and there were many new faces in the audience. We are counting on some new members as an outcome of this meeting.

Both meetings were held in the Canadian Industries Ltd. Theatre, at 625 Dorchester St. W., Montreal, which was loaned to us for the occasion and will be available for future meetings. The theatre gives a more pleasant atmosphere to our meetings and has better facilities for the showing of slides or films, than our previous meetings place; the Montreal Technical School.

All future meetings will be held on the fourth Wednesday of each month with the next meeting taking place on Jan. 26.

Answer to Thumbnail Sketch:
Harry J. McGowan
Bakelite Corporation.

SPE TECHNICAL CONFERENCE
Philadelphia, January 19-21



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CONFERENCE PROGRAM

(Continued from Page 9)

Service and Sales work on phenolic resins and molding materials.

Molding problems, however unique and unusual they seem to be, usually arise from the interplay of four related factors: the plastic material, the part design, the mold design and the molding conditions.

If part design and mold design are correct (an assumption that cannot always safely be made), the problem is caused by variation in the material or in the molding conditions. The process of solving such a problem then becomes a deductive one in which the various possible causes are catalogued and eliminated by careful testing until, if the trouble shooter is sufficiently persistent, analytical and lucky, and the customer sufficiently patient, the true cause or causes are determined.

In this paper, the most frequently encountered molding problems and their systems are described, the possible causes listed and the remedies indicated.

The difference between mere academic solutions and practical remedies which can be applied in a commercial molding plant, is pointed out. The work necessary to solve these problems may often have to be done under difficulties and the stress of production. The solution, when and if found, is usually not an elegant scientific one, but one which must be effective under production molding conditions.

Friday Afternoon, Jan. 21

2:00

PLASTIC FILMS

Milo R. Gerow

Mr. Gerow, Director and Past President of Newark Section SPE, product Manager of the Plastics Division of Reynolds Metals Company. He is a graduate of the University of Delaware, and before joining Reynolds Metals Company was with the Cellulose Products Department of Hercules Powder Company. Mr. Gerow has also been National Chairman of the Professional Activities Committee of S.P.E. during the past year.

This paper will review plastic films in packaging of industrial and consumer items, will indicate the size of various markets, and show trends which are to be expected as newer materials become available.

The various methods of production of film, and of combining it with metal foil, paper and cloth will be discussed. It will be shown that the choice of plastic film is frequently dictated by processing factors in making the package, and that the successful producer of film must keep in mind the problems of the convertor.

2:40

"POLYETHYLENE PERMEABILITY DATA AND THEIR PRACTICAL USE"

James H. Parliman

J. H. Parliman, Sales Engineer at the Plax Corp. for the last three years, holds a B.S. degree in chemistry from Worcester Polytechnic Institute '43). He was Production Engineer and later Sales Manager with Federal Telephone and Radio Corp., Cable Div., for two years before entering on a tour of duty with the U. S. Navy. After mustering out, he joined Plax.

Much costly and time consuming testing of polyethylene for packaging applications can often be eliminated if sufficient attention is given to available permeability data.

This paper reviews the simple bag method for obtaining approximate permeability rates, theoretical considerations, method for predicting permeability rates from other known data, effect of temperature and effect of liquid and gas phases.

New data are presented on the permeability rates of various liquids through polyethylene, including several inorganic acids, organic materials and various commercially marketed products. The permeation of hydrogen peroxide under both light and dark conditions and change of concentration of ammonium hydroxide are discussed.

Other examples of practical applications of permeability data in packaging problems, including permeability analyses of the components of several liquid cosmetics, are given, along with a discussion of the general problem of evaluation of permeability data for mixtures.

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3:15

TRENDS IN EXTRUSION MACHINERY

Albert A. Kaufman

Albert A. Kaufman, Vice President in charge of Engineering, Industrial Synthetics Corp., Garwood, N. J., was educated in Europe, receiving degrees in chemical and electrical engineering. He is well-known as an authority on extrusion machinery and techniques, and for compounding of vinyls for extrusion. He has pioneered in such products as vinyl garden hose, upholstery webbing and electrical tapes.

In the extrusion section of the plastics industry there has been less agreement than in the injection and compression section as to what constitutes desirable equipment. This paper will provide an up-to-the-minute review of designs of extruders and control equipment, with reference to various materials and extruded products.

LETTERS *(From Page 1)*

program chairman has to do is to follow up. The job will then be easier to fill.

Furthermore, to get busy men to devote the necessary time, I suggest that assignments be made more limited and more specific. For instance, our President Bill Johnson called me in and told me to make arrangements for the entertainment. This was a specific job for a specific occasion, and I was able to do it promptly and feel I had accomplished something. I can recall having once been advised to start a laminating committee and discover the laminators' problems — and without a laminator in our Section, the job plagued me for months, and in the end nothing was done.

I know that Cleveland Section Officers would appreciate your reader suggestions and ideas. Why don't you ask for the comments of our members as to what they want to make our meetings more lively and more entertaining — and more instructive.

Yours very truly,

A. R. MORSE.

DURITE PROMOTION

Durite Plastics now a part of the Chemical Division of the Borden Company, announces that **Sam Gurley, Jr.**, has been appointed Sales Manager, located at the Durite Executive Offices, 5000 Summerdale Avenue, Philadelphia 24, Pennsylvania.

SEE YOU IN PHILADELPHIA

W. NEW ENGLAND PRE HEAT TALK

By GEORGE W. MARTIN

The Western New England Section of the Society of Plastics Engineers, held their regular November meeting on the 3rd at the Hotel Sheraton in Springfield.

G. W. Martin

Dinner was served at 7:00 p. m. and the meeting commenced at 8:00 being presided over by Mr. Frank Donohue, President of the section.

There was a door prize for members, which was donated by A. G. Spalding & Bros. Inc.

Mr. Donohue explained to the members that the guest speaker for the evening, Mr. W. T. LaRose, of the W. T. LaRose & Associates Inc., was unavoidably detained and that he had requested two very well versed gentlemen of his company, to pinch hit for him. The president then introduced these two gentlemen, Mr. Robert Stokes, Sales Mgr., and Mr. Pat Moran, Technical Service representative.

Mr. Stokes gave a brief outline of the business of W. T. LaRose & Associates, which is Electronic Preheating and Heatsealing Equipment. He then pointed out that due to the extremely short notice that he and Mr. Moran were given, he thought it would be wise if they confined the rest of the talk to actual demonstration and discussion.

Mr. Moran first demonstrated their Thermall Super Hornet Preheater. He pointed out that this unit is quite unique because of its light weight and the small space that it requires.

The unit weighs only 118 lbs. and is 12 inches wide, and 19 inches deep, and 22 inches high, and can heat up to 10 ozs. in 60 seconds.

Mr. Moran explained that these newer machines have been greatly improved by the incorporation of certain radar principles. The particular unit that was being demonstrated happened to be the smallest size that his company manufactured, there is however, a preheater for practically every application. By the use of preheaters, molders have been able to reduce their molding time by 50% or more, thereby cutting down the number of molds necessary on any one given item. By enabling use of lower press operating pressures the molder then has the advantage of having a larger variety of jobs adaptable to his press capacities.

For jobs that require preheating of preforms for multiple cavity dies, the company manufactures loading board preheaters. This equipment can heat up to 5 lbs. of material to 270° F in 60 seconds.

It is the general opinion that, in the majority of cases, preform loading is highly recommended over powder loading, when high frequency preheating is to be used. This is due to the ease of handling and the fact that preforms heat more rapidly than powder.

Although the more common use of high frequency preheating is in conjunction with thermo-setting materials, it is possible to use it also on thermoplastic materials, with perhaps the exception of polystyrene and lucite. The only problem entailed here, is the dissipation of the resulting globules of moisture on the upper electrode. Several good methods have been successfully used for this however.

Mr. Moran and Mr. Stokes then went on to demonstrate the Electronic Heat Sealing Equipment. The unit which they demonstrated was set up for sealing two corners of a 4 inch acetate box (up to 20 gage). This same machine could be adapted to seal two corners of each of two 4 inch boxes simultaneously, or a 12 inch bar could be used to seal sheet vinyls, etc., of any length. This machine can also be adapted to polyethelyne of all forms. The equipment is extremely versatile and has been a real boon to acetate box manufacturers, who are now able to produce about 35 boxes per minute in a machine. Although the sealing time is only ¼ of a second, the balance of the time is taken up with handling.

At the conclusion of the demonstration, the members and guests were invited to try the equipment and were given samples of heat sealed boxes.

ST. LOUIS NOTES

By TODD CLARK

The November meeting of the St. Louis Section of the Society of Plastics Engineers was held at the Melbourne Hotel, Tuesday, November 16, 1948 at 7:00 p. m.

The speaker was Mr. Walter A. Kuenzli, Chief Cabinet Engineer, Servel, Inc., Evansville, Indiana.

Mr. Kuenzli also has conducted courses in Plastics for the Plastics Institute, and is well versed in the Plastics Industry as a whole. His company uses plastics in a number of forms which were amply illustrated by samples and applications.

BRACKEN AT CLEVELAND

By M. SCOTT MOULTON

On Friday, November 19th, W. O. Bracken expounded on "Dimensional Stability of Cellulosic Plastics and Synthetic Resins." Mr. Bracken who has done a good job before other S.P.E. Sections, illustrated his talk with slides. The meeting was held in Brown's Cottage Restaurant, 1706 Euclid Avenue, Cleveland, at 6:30 p. m.

Holiday Season Party

This year the Section is really going to have a party—no fooling. Plans are being completed for a dance-buffet supper to be held on Friday, December 17th at the Cleveland Club, Tudor Arms. A bar and card tables will be available, and the price will be only $2.50 per person—the Treasury promises to underwrite the balance. Mark the date down now, and we'll give you further details later when we go into high gear on promotion!

Fred Wehmer of Minnesota Mining & Manufacturing Company will speak on "Engineering Aspects of Adhesives" at a meeting scheduled for the Akron area on Friday, January 28, 1949.

PRINCETON TO ADVISE U. S.

On behalf of the Princeton Laboratory, Professor Rahm also announced today the formation of a Services Advisory Committee to consult with the Plastics Committee of Princeton University on the needs of the Army and Navy in plastics research. The committee which will meet in Princeton quarterly is composed of four representatives of the Army Signal Corps, and two representatives each of the Office of Naval Research, the Navy Bureau of Ships and the Navy Bureau of Aeronautics.

PHILADELPHIA MEETS

Our November Meeting of the Philadelphia S.P.E. was held on Tuesday, November 16th, 1948, at the Franklin Institute, in Philadelphia, with Dinner at 6:00 o'clock, at the Dairy Dell, in the Institute and Meeting at 8:00 o'clock.

The Board of Directors wish to express their thanks for the cooperation of the members in the auction held at the last meeting. Their thanks go out to all those who donated items and especially to those who spent their money in buying the items. The amount realized was approximately $95.00. Our appreciation is expressed to George H. Sollenberger and Reimer Schacht, who, should they ever need to, can earn a good living as auctioneers.

NEW YORK

"Plating on Plastics"

By A. M. MERRILL

A talk on "Metal Plating on Plastics," by Harold Narcus, president and research director of Electrochemical Industries, Inc., featured the November 9 dinner meeting of the New York Section. Presided over by president Arthur Nufer, Bakelite Corp., the meeting was held at the Hotel Sheraton and attended by approximately 43 members and guests.

A. M. Merrill

Dr. Narcus began his talk with a discussion of the advantages of plated plastics as compared with unplated plastics. Experiments show a marked increase in tensile, impact, and flexural strengths for many plated plastics, an appreciable increase in heat distortion temperature, and also a decrease in water absorption of the plastics when completely enveloped in a metal plating. In addition, a metal on plastic plating does not show a galvanic couple and is therefore more corrosion resistant than a metal on metal plating. The two main purposes for metal plating a plastic are to render the plastic a suitable substitute for critical or strategic metals, and to produce a product which has the inherent properties of the plastic in addition to the desired properties of the plated metal.

For plating on plastics, methods employing metal powders in a lacquer or varnish medium, metal spraying, cathode sputtering, and metal evaporation can be employed but are not too satisfactory in production work. Such commercial operations can best be accomplished by electroplating. This method involves the application to the plastic surface, after proper preparatory treatment, of a conductive and adherent bond coat by using a solution of ammoniacal silver nitrate and a suitable reducing agent, followed by an intermediate layer of electrodeposited copper or silver, and finally a top layer of the desired metal plating. Dr. Narcus also described his company's new Cupron process which employes a copper sulfate solution and deposits a copper film in place of the silver bond coat. This copper process is cheaper than the silver method and gives films possessing greater adhesion.

The speaker emphasized that the preparatory treatment of the plastics surface is the major factor in obtaining a satisfactory metal plating, and consists of a "de-glazing" or slight roughening of the surface followed by thorough cleansing. The thickness of the chemically precipitated silver or copper bond film can be measured quantitatively by either the weight or optical methods. Dr. Narcus' talk was illustrated with slides and samples of metal plated plastic parts, and was followed by a lively discussion period.

In the business session preceding the technical paper, Mr. Nufer announced the selection of the following candidates for the three existing vacancies on the section's board of directors: George Baron, Ideal Plastics Corp.; Nicholas Fasano, Washington Molding Co., Inc.; Palmer Humphry, consultant; Leon Lautin, Quality Plastic Co.; Ed Walsh, Tech-Art Plastics Co.; and Bruno Wessinger, Wess Tool & Die Co. The new directors will be elected by letter ballot and will meet with the full board of directors prior to the section's December meeting to elect new officers for the group.

The new officers will be installed at the December 14 dinner meeting, to be held at the Hotel Sheraton. The meeting will also feature a talk on packaging with plastics by Carl Cobbledick, head of the packaging design department of Egmont Arens.

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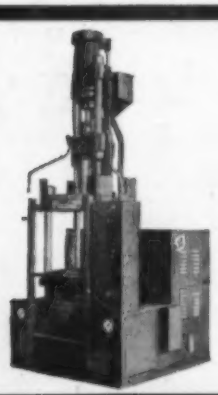
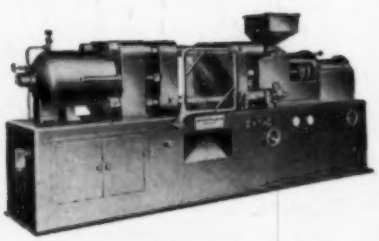
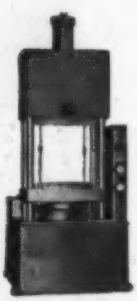


Vertical Injection Molding Machines 1, 2, and 4 Ounces

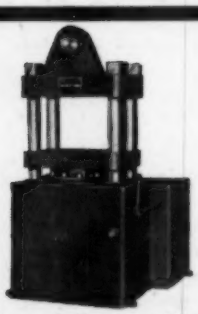


Horizontal Injection Molding Machines 8 to 80 Ounces

Preform Tableting Machines 10 and 100 Tons

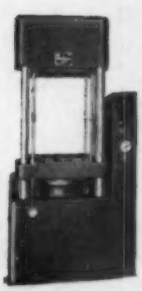


Transfer Molding Machines 30 to 1200 Tons



General Purpose Presses 20 to 200 Tons

Compression Molding Presses 50 to 1200 Tons



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